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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • MARCH 8, 1947

Scientists Met President

See Page 149

A SCIENCE SERVICE PUBLICATION

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GENERAL SCIENCE

For a Science Foundation

Intersociety committee organizes to help Congress provide for exploration of great unknowns; Cornell's President Day heads new group. House hearings start.

➤ BOTH Congress and scientists are getting set to create a national science foundation for the exploration of the world's great unknowns.

Just as science was mobilized during the war to give the military new weapons, such as the atomic bomb, it is planned to support and encourage research in universities and other laboratories to dig out the new basic knowledge for future use in peace and war.

Six bills for various kinds of science foundations are before Senate and House committees. The first hearings were scheduled for March 6 and 7 when the House Committee on Interstate and Foreign Commerce planned to devote eight hours to hearing witnesses. This is the same committee that in the last Congress failed to report on science bills in the closing days of the session and thus blocked passage of the bill that had been passed by the Senate.

Recently 120 representatives of scientific societies met in Washington and formed an intersociety committee on a national science foundation. This is the largest and most representative meeting of the sort that has been held in the history of American science.

President Edmund E. Day of Cornell was elected chairman and Dr. Harlow Shapley of Harvard was chosen vice-chairman, with Dr. Dael Wolfle of American Psychological Association as secretary-treasurer. Six executive committee members from various parts of the country, representative of various fields of science and points of view regarding foundation proposals were also chosen.

Executive committee members include the officers and President Isaiah Bowman, Johns Hopkins; Dr. Ralph W. Gerard, University of Chicago; Chancellor R. G. Gustavson, University of Nebraska; Dr. Henry Allen Moe, Guggenheim Foundation; Dr. W. Albert Noyes, Jr., University of Rochester; Dr. Douglas M. Whitaker, Stanford University.

The principal differences among scientists are concerned with how the proposed foundation should be administered. The bill that in the last Congress passed the Senate provided an administrator presidentially-appointed and Senate-confirmed, with an independent part-time advisory committee of scientists. Senator Elbert D. Thomas, D., Utah, has introduced this bill as S. 525.

A new bill introduced by Senator H. Alexander Smith, R., N. J., provided a part-time foundation membership of 48, which would appoint an executive committee of nine, which in turn would select a director and heads of the working divisions.

To provide a united front, scientists through their new committee may favor some compromise between the single administrator and the large committee. This may be a full-time commission of five along the lines of the atomic energy commission. Polls among the new intersociety committee show that a combination of those favoring a single administrator or a commission outnumber better than two to one those favoring control vested in a large committee.

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COMMITTEE HEADS—Dr. Harlow Shapley was elected vice-chairman of the committee; Dr. Edmund E. Day, chairman; and Dr. Dael Wolfle, secretary-treasurer.

VOLCANOLOGY

Mount Etna Eruption Threatens Sicilians

➤ MOUNT ETNA, Europe's largest volcano, has again erupted, sending rivers of molten lava down its slopes to threaten the inhabitants of Sicily.

History's original volcano, from which the name "volcano" is believed to have come, has sent lava down on the island in the Mediterranean since the days of Plato and Aristotle. With the flows, have come death, destruction and perhaps the richest soil in the world.

Sicily, at the tip of the toe of Italy's boot, boasts as many as five crops a year and some of the most famous vineyards in the world as a result of Mount Etna's sometimes dangerous flows. Other European grape areas in northern France and southern Germany are also on lava soil left by long-since-vanished volcanoes.

Because Mount Etna does not usually explode when it erupts, few lives have been lost in modern eruptions, but history records several thousand deaths for Mount Etna's flows in the years 1169 and 1669. Most recent major eruption of the volcano was in 1928.

The name "volcano" comes from Vulcan, blacksmith god of fire and metals in the belief of the ancient Greeks and Romans.

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PHOTOGRAPHY

One Step Makes Pictures

New camera takes and produces finished picture in one minute. Tiny pod between film and paper does darkroom work. Process may be good for motion pictures also.

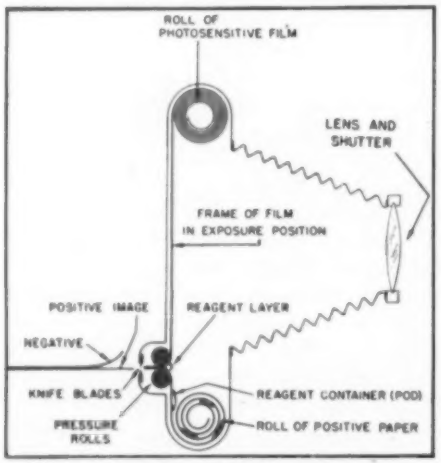
➤ TAKE A SNAPSHOT; turn a knob; and wait one minute. Then you have a finished picture with a new camera demonstrated for the first time to the Optical Society of America meeting in New York.

The camera, which can be made in the shape or size of most modern cameras, gives you a finished, dry picture and completely developed negative in one minute without tanks and darkroom, or several days or weeks of waiting to get your films back from the corner drugstore. If the picture turns out badly, you can "shoot" it again on the spot.

A tiny pod or sealed chamber between the film and photographic paper loaded in the camera does the work of the tank and trays of chemicals in a photographer's darkroom. After a picture is snapped, a knob is turned to send the sandwich of film and paper through a ringer of two small rollers on the camera.

This pressure releases a few drops of viscous chemical and spreads a moist layer between the film and paper. After one minute, you can strip away the film from the completed picture.

Chemical ingredients of the small pod include standard photographic developer, hydroquinone; fixer, sodium thiosulfate or hypo; and a viscous reagent. Each tiny container of chemicals contains enough to develop the negative and print the picture in a single-step operation in one minute.



ONE-MINUTE SNAPS—This diagram for a camera that produces a picture in a minute was designed by the Polaroid Corporation.

The new process was demonstrated by its inventor, Edwin H. Land, president and director of research of the Polaroid Corporation, Cambridge, Mass. The new cameras are not on the market yet, and Polaroid officials predicted that it will be "several months" before the new development will be available.

In addition to letting the amateur photographer see his snapshot one minute after he has taken a picture, the one-step camera will make it possible to put technical pictures to immediate use without using a darkroom.

The process, which will turn out pictures in temperatures ranging from the heat of midsummer to below freezing, can be adapted to color pictures and motion pictures, Mr. Land told the Optical Society.

In some of several one-step processes he described, the negative can be used to print other pictures, and in all of them copies can be made by photographing the print or re-photographing the scene.

Mr. Land has developed four different methods for producing a finished picture in a single operation. In his soluble silver complex process, the developer and hypo perform twin duty between the film and the paper to utilize silver from the film in printing the picture.

In addition to the developer, fixer and viscous reagent in the small pod between the film and paper, the pod or the paper has other ingredients which control the size of the silver particle to determine the color of the print, control the rates of the various reactions, prevent discoloration of the print, and make the process work in a wide range of temperatures.

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BIOLOGY

Dr. Ross G. Harrison Wins John J. Carty Medal

➤ DR. ROSS G. HARRISON, Yale biologist who was chairman of the National Research Council from 1938 until last year, will be given the John J. Carty medal of the National Academy of Sciences at its annual meeting in April.

Dr. Harrison will be honored in part for his researches upon the nervous system which led to tissue culture as now practiced widely in cell growth studies, and in part for his service in directing the National Research Council.

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Of the 12 *minerals* required in proper farm animal nutrition, some are called trace minerals because needed in very small quanties; the 12 are calcium, phosphorus, magnesium, sodium, potassium, chlorine, iodine, manganese, iron, copper, cobalt and sulfur.

SCIENCE NEWS LETTER
Vol. 51 MARCH 8, 1947 No. 10

The weekly summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents.

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Entered as second class matter at the post office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566, and 360 N. Michigan Ave., Chicago, STate 4439.

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GENERAL SCIENCE

Science Talent Institute

Leading scientists addressed the 40 Science Talent Search winners who came to Washington to compete for $11,000 in Westinghouse scholarships.

See Front Cover

➤ THE YEAR's top high-school scientists made an honor-trip to Washington to attend the Science Talent Institute as the culminating event in the Science Talent Search, conducted by Science Clubs of America, administered by Science Service.

There they heard eminent scientists whose talks are reported in this issue of the SCIENCE NEWS LETTER. Coverage of the Institute will be continued in the issue of March 15, also, when the scholarship winners will be announced.

President Truman

The picture on the cover of this SCIENCE NEWS LETTER shows the winners at the White House, where they were welcomed by President Truman. He urged them to develop a common sense ability to apply their scientific knowledge to the world's problems. He told the teenagers that the next generation will depend increasingly on scientific knowledge and that we need people to put scientific ability to work for the benefit of the entire world.

In response to an invitation extended to him by one of the young scientists, President Truman paid a surprise visit to the Saturday evening hobby dinner. For about a quarter of an hour, the President, accompanied by his staff, viewed the project exhibits and then he continued into the annual dinner of the White House Correspondents Association which he came to the Hotel Statler to attend.

Heart Surgery Advancing

➤ A GROUP of nearly 300 "blue babies" who have been given a new lease on life by a surgical operation point the way to surgical rescue of other patients with heart disease.

"Surgery of heart disorders is in its infancy and many advances will be made in the future," Dr. Alfred Blalock, professor of surgery at Johns Hopkins Medical School and originator of the "blue baby" operation, declared at the Sixth Annual Science Talent Institute.

Forty high school seniors, boys and girls who are winners this year of the Science Talent Search conducted by Science Service for Westinghouse scholarships that may enable them to become famous surgeons some day, heard Dr. Blalock describe the "blue baby" operation and saw moving pictures of it.

The operation has been performed on about 330 patients at the Johns Hopkins Hospital in the past two years. Similar operations have been performed in other hospitals. The overall mortality rate is about 18%.

Most of the patients who have survived the operation are markedly improved, Dr. Blalock reported. Some of the patients who could walk only a block or two before the operation can now walk miles.

The so-called blue babies, some of whom are not infants, are blue because their blood does not contain enough oxygen, Dr. Blalock explained. In most cases this is because the blood vessel which ordinarily transports blood to the lungs where it takes up oxygen from the inspired air is constricted. The blood flow to the lungs is markedly reduced and hence an inadequate volume of blood is exposed to oxygen.

The "blueness" or cyanosis of the patient may be very marked.

Much more alarming is the incapacity of the patients. Most of them can walk only a short distance and this only with undue effort. Furthermore, many of them develop complications such as thrombosis or clots in the blood vessels of the brain resulting in paralysis.

The operation consists of the making of a shunt or by-pass between a branch of the aorta which conducts blood to the body (excluding the lungs) and the pulmonary artery (beyond the point of constriction or stenosis) which transmits blood to the lungs. Fortunately the pressure within the aorta is very much higher than that in the pulmonary artery. A large volume of blood will reach the lungs through a relatively small artificial opening and will take up oxygen, thereby reducing the cyanosis and the disability.

Stars from Atomic Action

➤ ATOMIC COMMOTION may well be behind the activity that causes a star to burst forth into a bright light, only later to fade into its former obscurity.

The theory of the cause of a "new star," known as a nova, was presented by Dr. Samuel G. Hibben, Westinghouse scientist, to 40 high school seniors from widely distributed schools throughout the country.

Explanations of novae have brought

TALKING SCIENCE—Winners heard scientists and talked with them at the Science Talent Institute. These students are questioning Dr. M. A. Tuve.

varying theories among astronomers, Dr. Hibben said, and expressed his belief that they probably are caused by a "species of molecular or atomic disintegration rather than by frictional heat dissipation. Development of the atomic bomb, which possibly is a miniature nova built on earth, will help science to better understand novae."

The mercury vapor lamp, and other modern electric light sources, were described by the Westinghouse lighting specialist as "distant cousins" of the atomic bomb. The methods of producing artificial light by other than incandescent means, he pointed out, "are remarkably similar to methods used in creating the world's most powerful explosive, although the lamps are tamed considerably by controlled operation."

The atomic bomb tests proved that the bomb was a tremendous illuminant as well as a powerful explosive, Dr. Hibben continued, thus giving the scientist "a hint of the atomic rearrangement likely to emit tremendous quantities of light. Consequently, modern lamps that operate on the general principle of atomic disturbance contain a hint as to how these new light sources can be of the highest potency."

Hopes for future progress in lamps are pinned primarily upon advances in fluorescent and other vapor discharge light sources unknown to the public a decade ago. Incandescent types will continue in wide use in spite of the fact that attainment of their peak efficiencies is not far away.

Milky Way to Be Mapped

➤ RESEARCHES of the past few years at Harvard's Oak Ridge astronomy station in Massachusetts have been merely pilot programs for the great study ahead of the Milky Way system, Dr. Bart J. Bok, associate director of Harvard College Observatory, told 'teen-age scientists attending the Science Talent Institute.

A five-year plan just inaugurated at Harvard should enable us to map accurately not only the direction, but the exact location in space of stars in our own Milky Way galaxy, Dr. Bok informed them. The survey should pry loose secrets about the heavens to a minimum distance if 117 million billion miles from the sun, and is expected to disclose information about the sky right up to the center of our Milky Way system.

The organization of the study and the methods to be employed have already been tested in small-scale programs for a few regions of the sky. Star counts and color measurements made at the Oak Ridge station near Harvard have given experience of great value in planning the equivalent southern programs.

The proposed five-year study of stellar distribution should throw light on the spiral character of our galactic system and—most important—give clues to the population characteristics of the central star clouds. It is expected to reveal whether the observed faint, red stars in the central clouds are highly-reddened luminous giants, seen through a thick cosmic mist, or truly red stars seen through a relatively thin haze. Astronomers should discover at what distance from our sun the increase in star numbers indicates that we are coming into the central star clouds.

Western Culture Minority

➤ WESTERN CIVILIZATION, already outnumbered two to one in the population of the world, is becoming an even smaller minority, Dr. Frederick Osborn, director-at-large of the Social Science Research Council, warned the group of young scientists.

Only about 600,000,000 people of the world's population of 2,000,000,000 have the Western European tradition of Christianity, self-government and freedom, Dr. Osborn said.

In the next 25 years, western civilization will barely hold its own in population, he predicted, while Asia will increase by 350,000,000 unless war or famine wipe out large numbers. Russia will gain 50,000,000 in the next quarter-century, and Africa 60,000,000 people.

"If we are going to spread the American way of life, which we so much believe in," Dr. Osborn declared, "we are going to have to do some pretty fancy missionary work, or we will be swamped by quite alien cultures in which life is held very cheap and in which the individual and his right to the pursuit of happiness are negligible."

Science, by increasing our knowledge of man and his behavior, can help spread our ideals to the rest of the world, the social scientist told the teen-age scientists.

"For the first time we have a little real knowledge about individual differences," he said, explaining that personnel work by industry and the Army, studies of consumer interest, public opinion polls and new sampling methods and techniques are all beginnings toward an understanding of the effect of different surroundings on human attitudes and motivations.

Tools provided by science offer a hope for the future of introducing a more rational way of thinking to the world, Dr. Osborn concluded.

Earth Magnetism Changed

➤ THE EARTH'S magnetic field as it existed 20,000 to 30,000 years ago is being studied by modern scientists, Dr. M. A. Tuve, director of the Department of Terrestrial Magnetism, Carnegie Institution of Washington, told the Science Talent Institute.

Dr. Tuve, who directed part of the work on the World War II proximity fuze, explained that very slight permanent magnetism still remains in annual glacial clay-deposits, called varves.

A compass of several thousand years ago would have slowly varied in direction over a period of years. Systematic studies have shown this change during the past three centuries, Dr. Tuve said.

Future research in physics, the scientist told the teen-age group, will cover a much wider field than atomic energy and artificial radioactivity.

He showed motion pictures revealing the recent discovery of rapid variations in the ionized part of the upper atmosphere. Discovery of these changes, due to inrushing clouds of particles from the sun, was made with a radio pulse technique.

Science Must Have Freedom

➤ INTERNATIONAL freedom in science was termed essential to the welfare of the world by two of America's leading scientists as they answered questions from teen-age winners of the Sixth Annual Science Talent Search.

Dr. Harlow Shapley, director of the Harvard College Observatory and president of Science Service, and Dr. E. U. Condon, director of the National Bureau of Standards, were guests of Watson Davis, director of Science Service, on Adventures in Science heard over the Columbia Broadcasting System. They discussed "International Cooperation in Science" with some of the 40 high school scientists.

Describing freedom to scientific research as "one of the essential elements in the civilization we have all been fighting for," Dr. Condon declared, "we must have freedom from secrecy and freedom from national boundaries."

Questioned concerning military secrecy by one of the high school scien-

ists, Dr. Condon said secrecy "should not be applied to scientific principles and basic research data.

"As long as we have armies and navies and air forces with their military equipment, it will be desirable to keep secret specific design features. Such a policy would not react unfavorably on international cooperation in science, and it won't hamper the work and the development of our own science," the director of the Bureau of Standards explained.

Dr. Shapley, who recently returned from lectures and conferences in India, said, "Science is an integral part of the culture and civilization of America.

"But our science must not be nationalistic. In these days of a shrinking planet, and an expanding brotherhood of men of all latitudes and longitudes, we must develop planet-wide concepts of the functions of science in society," the astronomer declared.

Urging young scientists to tackle "scientific problems on an international basis," Dr. Shapley suggested nutritional studies as an example.

Students of nutrition and allied problems "should think of the nutrition problems of the Tropics and the Arctics, as well as what goes best for us in the Temperate Zone."

Dr. Shapley reported that several hundred students from India are on the waiting list for one American technological school alone and that there are other countries whose students seek to enter our colleges and universities.

Explaining that he was startled to learn of this situation, the scientist added, "And the situation disturbs me because I fear that we in the fields of education and science do not sufficiently realize our heavy responsibility in the advancement of civilization and our golden opportunity to serve the world."

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MEDICINE

Legs Saved From Gangrene

Vitamin-amino acid combination starts body reactions which halt gangrene. Treatment may be useful for other blood circulation-impaired diseases.

➤ FIVE VETERANS who faced amputations of feet or legs because of gangrene are on the road to recovery. Their blackened, shrivelled, mummified toes are getting soft and pink and ready for walking.

Another six are also recovering from the same excruciatingly painful blocking of blood circulation which caused gangrene in the first five.

A new treatment with a vitamin and an amino acid is responsible. It was devised by Drs. Zolton T. Wirtschafter and Rudolph Widmann at Wadsworth General Hospital, Veterans Administration Center, Los Angeles, as reported to the *Journal of the American Medical Association* (March 1).

Patients with disease of the heart's artery, with angina pectoris, high blood pressure, kidney disease, paralytic strokes and a half dozen serious ailments may be helped by this same new treatment.

The treatment itself consists of injections of synthetic vitamin C, or ascorbic acid, and of another chemical, histidine, which is one of the amino acids that are building blocks of protein.

Vitamin C converts histidine into another chemical, histamine. This was a test-tube discovery made 10 years ago by a German chemist, P. Holtz. The VA doctors are apparently putting the same chemical reaction to work in the bodies of the patients.

Histamine has a powerful dilating effect on small blood vessels. Contraction of small blood vessels by inflammation of the lining of the vessels or the presence of clots in the vessels can dangerously slow blood circulation. Gangrene is one result. Tissues deprived of blood die and decay. The affected part must be cut off to stop the spread of the gangrene, if possible. Before the gangrene, patients suffer horrible pain which frequently cannot be relieved by any drug.

Getting the blood circulating again is the object of doctors treating the condition. In New Orleans Dr. R. A. Katz, after heroic experiments on himself, tried injecting ether into the patient's veins to increase circulation of the blood.

Drs. Wirtschafter and Widmann tried this ether treatment. They found it helped some patients but not all, and caused complications which made it necessary to discontinue the ether injections. Studies they made of the patients getting the ether treatment, however, suggested that it increased circulation by causing a release of histamine in the body.

This gave them the idea of trying the vitamin C-histidine reaction to produce histamine.

The results, with patients relieved of pain in a few hours and gangrene beginning to clear up in a day or two, make the method worthy of further investigation, they believe. They are going to try it for a number of serious diseases in which blood circulation is impaired.

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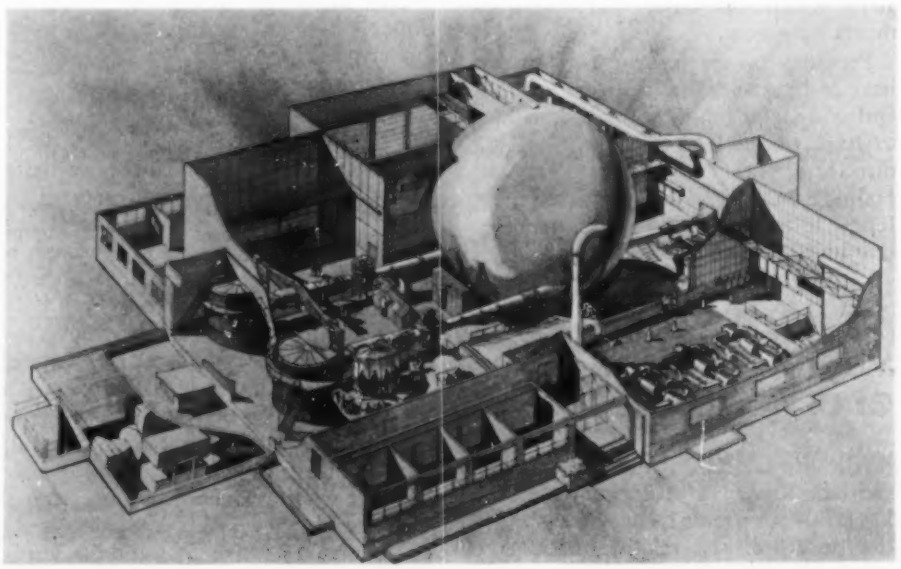

***WIND TUNNELS**—Original supersonic wind tunnels captured at Kochel, Germany, will be reinstalled in this special building of the new Naval Ordnance Laboratory, now under construction at White Oak, Md.*

PUBLIC HEALTH

Well-Grandparent Clinics Are Predicted for Future

➤ WELL-GRANDPA and grandma clinics may be on their way. They would be the equivalent for the old folks of the well-baby clinics to which for many years mothers have been taking their babies at regular intervals. At the well-baby clinics the young ones are weighed and measured and examined. Mother tells doctor whether she has been having any trouble getting the baby to eat or to behave properly. Doctor gives advice on diet, habit training, how to keep baby well. If any physical defects or ailments are found, proper methods of correction are suggested.

At the well-grandpa and grandma clinics the procedure would be somewhat similar. The weekly or monthly measurement of height would not be necessary, nor would the old folks be likely to get "shots" to prevent them from "catching" diseases. But they would be weighed and examined carefully by the doctor. Suggestions on diet, or remedying of defects and ailments from poor eyesight to cancer, and on living habits would be made.

Signs that such clinics may be coming are seen in the increased interest in problems of aging now being taken by health and medical authorities. Another sign is the establishment within the Indiana State Board of Health of a division of adult hygiene and geriatrics. This is like the divisions of child hygiene and pediatrics which many state health departments have now.

People who are growing old do not have to be senile, that is, feeble in mind and body, any more than children have to have rickets, Dr. William F. King, director of the new division, points out. Helping men and women who are living longer to live better is, he says, the objective of his division.

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PHYSICAL CHEMISTRY

Magnet Measures Amount Of Oxygen in Gas Mixture

➤ PROF. LINUS PAULING, one of the best known of American chemists, has taken out patent 2,416,344 on a device that measures the relative amounts of oxygen in mixtures of gases. It depends on the known fact that oxygen is slightly attracted to a magnet, while most other common gases are repelled.

The device consists of a pair of spheres connected by a slender rod, suspended between the poles of a strong magnet by a filament attached to the middle of the rod. Response of the spheres to the magnetic pull is conditioned by the oxygen concentration; the amount and rate of their swing is registered by means of a light beam reflected from a small mirror attached to the filament.

Dr. Pauling has assigned rights in his patent to the California Institute Research Foundation.

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MEDICINE

Emotional Tension Starts Trouble Like Sinusitis

➤ ABOUT THIS TIME of year a good many persons suffer attacks of sinus trouble. Some of these cases are probably the aftermath of a cold or other infection of the nose and throat. Some of the cases, however, and probably particularly those in which the trouble hangs on for months and keeps coming back, may be due to emotional tension.

True sinusitis is an inflammation of the sinuses, which are the air-containing cavities in and around the nose. Pus is formed and retained in the sinuses and must be drained out. Sometimes this can be done by shrinking the tissues with medicines, letting the pus flow out. Sometimes the doctor must insert a large needle into the sinus and wash the pus out.

How emotional tension can bring on sinus symptoms, such as a stuffy nose, mucous discharge and headache, is explained in a recent report from the National Hospital for Speech Disorders somewhat as follows:

Tension results in disturbed activity of the autonomic nervous system. This system is the body's chief integrating mechanism. Tension working through it may affect the body generally, making you feel irritable and nervous, or it may affect just one part of the body. An example of the local effect is excessive sweating of the palms of the hands when a person is tense and anxious.

Instead of getting clammy hands when tense and anxious, some people may get what amounts to clammy noses. The membranes inside the nose may swell, causing congestion and stuffiness, or they may secrete an overabundance of mucus, or both. The person with this state of nose thinks he has sinus trouble.

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IN SCIEN

OPTICS

Removing Reflections Gives Better Television Pictures

➤ THE PROCESS that produced glareless glass for military field glasses during the war is now used to give clearer, sharper television pictures, the American Optical Company revealed.

The method removes light-consuming reflections from the glass face of the cathode-ray tube which serves as a screen of a direct-viewing home television receiver. It also produces images of greater clarity when used with the projection type receiver.

The reflections are removed by directly coating the face of the television tube with a chemical substance based on a silicon composition on which patent applications have been filed. It is not necessary to disassemble the tube for the coating process, or to apply the coating in the vacuum chambers used in earlier glare-removing methods.

By reducing the reflections in the glass face of the tube caused by light in the room in which the television receiver is located, false images caused by reflections are eliminated, and more light is transmitted.

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CHEMISTRY

Use of Fluorine in Rubber Synthesis Improves Product

➤ AN IMPROVED TYPE of synthetic rubber, especially well adapted for use in electric insulation, is the subject of U. S. patent 2,416,456. The inventor, Dr. L. Frank Salisbury of Wilmington, Del., has assigned rights to E. I. du Pont de Nemours and Company.

Hitherto, a special rubber for this purpose has been produced as a copolymer of chlorinated butadiene (chloroprene) with styrene. Dr. Salisbury substitutes chlorine's once-wild chemical cousin, fluorine, using essentially the same formulae and methods of preparation. The new compound has high resistance to the aging effects of sunlight and ozone and to the action of oil and other rubber solvents, remains highly elastic at low temperatures, and shows surprisingly high tensile strength.

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NCE FIELDS

RADIO

Visual System Monitors Many Radio Channels

➤ A VISUAL SYSTEM for simultaneous monitoring of many radio channels is covered by patent 2,416,346, granted to Ralph K. Potter of Madison, N. J., a Bell Telephone Laboratories engineer. An oscilloscope, with the sensitive surface in a band around the equator of its spherical head, is kept constantly rotating, while the beam that registers incoming radio waves is deflected onto the luminescent area.

Science News Letter, March 8, 1947

GENERAL SCIENCE

Successful Scientific Research Needs Freedom

➤ HUGE-SCALE scientific operations, such as those that produced the atom bomb, are no guarantee of success in fundamental research, Prof. Henry W. Smyth, Princeton University physicist who wrote the first comprehensive account of the production of atomic energy for military purposes, usually known as the Smyth Report, declared in an address before the Sigma Xi chapter of the University of Washington at Seattle.

The titantic effort symbolized by the name, Manhattan Project, he pointed out, "was principally applied physics and therefore its successes in terms of organization and direction have little bearing on the future of fundamental scientific research."

The first actual production of energy through nuclear chain reaction, he said, was achieved in an experiment on a laboratory scale in Chicago in 1942. In reality, it was done in much the same manner as it would have been done in a peacetime laboratory.

Without underestimating science's need for powerful research machines, Prof. Smyth continued, "it should be emphasized that freedom from too much direction or supervision appears to be a necessary condition for productive scientific research.

"This freedom is meaningless without freedom of publication and of international exchange of information. It may be that the requirements of international politics will interfere with these conditions, but let us not have any illusions.

"No amount of government financing or of organization and official correlation will automatically keep free imaginative research going. Men of first-class research ability will be stultified or more probably will be diverted to fields of research where there are no restrictions.

"The war period was a period of cessation of scientific research and a continuation of a war atmosphere will prevent the healthy rebirth of scientific research."

Science News Letter, March 8, 1947

PLANT PATHOLOGY

Late Tomato Blight Makes Early Appearance

➤ LATE BLIGHT is making an early appearance in Florida tomato fields, according to reports reaching the U. S. Department of Agriculture. This fungus disease, which devastated the commercial tomato crop in the East last summer, started in the same state and marched up the map as the season advanced. Some Florida growers have already stated that their efforts to combat the new outbreak with highly-touted new organic fungicides have not been too successful so far.

Tomato growers were caught off guard last year, because it had been a long time since weather conditions favored an outbreak. This time they do not mean to repeat that costly experience. They have been making heavy purchases of spraying apparatus and laying in supplies of chemicals.

Scientists at the state agricultural experiment stations have set up an intelligence service. They will gather information from the field and forward it to a clearing-house at the Department of Agriculture in Washington, where it will be digested and put into bulletin form for prompt distribution.

Forces of defense are thus better armed and better organized than they were in last year's disaster.

It may turn out that these precautions are unnecessary. The blight fungus thrives best in damp, cool weather, and in warm, dry years does not amount to a real menace. A study of its recent history shows that its two severe outbreaks in the past seventeen years have come when prevailing temperatures during May and June have been below 75 degrees Fahrenheit, with rainfall above normal.

Science News Letter, March 8, 1947

MEDICINE

Amino Acid Enters Black Cancer Mystery Solution

➤ SOME of the mysteries of black cancers, called melanomas, may be solved through a new tool built in the Radiation Laboratory of the University of California.

The new tool is a fundamental body chemical which has been synthesized with radioactive carbon. The chemical is tyrosine, one of the amino acids which are building stones of proteins. Its synthesis with radiocarbon was accomplished by Dr. J. C. Reid working under Dr. Melvin Calvin, according to a report to *Science* (Feb. 21).

Tyrosine may be involved in the black cancers, or melanomas. The cancers are black because they contain a substance called melanin. Melanin gives the dark color to dark hair, skin and eyes. Tyrosine may be the material from which certain cells of the body make melanin.

The exact relation between tyrosine and melanin and melanomas and the reason why some melanomas lose their power to produce blackness may be learned with the tyrosine that can be traced through the body by its radiocarbon.

Even more immediate practical use of tyrosine with radiocarbon may be made in the study of plants. Tyrosine or a close chemical relative plays a part in the blackening of potatoes and apples. More knowledge of this reaction and how to combat it may come from the new radiocarbon-tyrosine.

Science News Letter, March 8, 1947

ENGINEERING

Low-Melting, Fusible Vents Localize Fires in Buildings

➤ A NOVEL IDEA for localizing fires in large factory or warehouse spaces is embodied in patent 2,416,284, granted to Arthur L. Brown of Boston, assignor to the Factory Mutual Research Corporation. His design calls for the incorporation of panels of low-melting-point materials, such as fusible alloys, rubber compounds or plastics, into the roof structure. The idea is that if a fire can quickly make a hole in the roof it will not spread laterally, nor will smoke fill the building, preventing effective approach of firemen.

Science News Letter, March 8, 1947

MATHEMATICS

Your Chances at Betting

Gambling can be discussed as a matter of mathematics, but professional gambling does not offer as good odds as mathematical chances.

By HOWARD D. GROSSMAN

➤ LIFE is a gamble. Every time we make a choice or a decision, we gamble. Even marriage is a lottery.

Betting is just one phase of gambling. In the matter of morality, mathematics is perfectly neutral. Gambling can be discussed purely as a matter of numbers.

Some of the greatest mathematicians, like the Frenchmen, Pascal and Fermat, calculated the chances of the gaming-table. Out of their discussions were born the great branches of mathematics: probability, statistics, theory of combinations and actuarial science.

Probability is vital to life insurance, the study of heredity, prediction of the weather and a thousand other activities.

When the odds in gambling are mathematically correct, the favorable and unfavorable chances are perfectly equal. In professional gambling, however, the market odds fall short of the correct odds, and your chances of winning are not so good.

Some Money Lost

From an alleged perpetual-motion machine we get less energy than we put in because some of it is dissipated in friction and heat. So from professional gambling we receive less money on the average than we bet because some of it is dissipated in the maintenance of gambling quarters, material and personnel.

The thrill of gambling is a commodity that must be paid for. The difference between the market odds and the correct mathematical odds determines its average cost.

In professional gambling the house usually withdraws the following percentages of the total money bet, redistributing the rest among the gamblers:

Roulette (French type, single zero)	3%
Roulette (American type, double zero)	5%
Chuck-a-luck	8%
Sporting events with odds of 5 to 6 on either side	8%
Horse races	15%
Slot machines	at least 25%
Numbers racket—a gross swindle	50%

The house takes its percentage of the money you bet as well as the money you win. This is more than the house percentage of your winnings alone and has the effect of shortening the correct odds by more than the house percentage. The smaller the correct odds, the sharper the cut. Thus if the house percentage is 10 per cent and the correct odds are 1 to 1, the odds become only 4 to 5, a drop of 20 per cent.

An illusion prevails that a betting system increases one's chances in gambling. In the popular system of doubling up, where you risk a dollar on an even bet like the toss of a coin and double the bet after each loss until you win—if ever—there always remains a small chance of losing a large sum. As the chance becomes smaller, the possible loss increases. This risk always exactly compensates for your near-certainty of winning $1.

The superstitious faith in the magic of a betting system is founded on a misconception of the basic law of chance. If the number of heads in a series of throws really tended to equal the number of tails, then each past tail thrown would have to increase the chance of a future head. But it is not the total number of heads tossed that tends to equal that of tails, but the percentage of tosses that tends to be equal.

Consider the case of a man who, in tossing a coin, gets heads the first 20 throws, then heads and tails alternately thereafter. If he tosses the coin only 20 times, only heads turn up. If he tosses 40 times, his score is 75 per cent heads and 25 per cent tails. But when he tosses the coin 1,000 times, only 51 per cent of his throws show heads and 49 per cent tails, or a fairly equal number of each.

Long Series Improbable

A series of 20 heads would be very rare. Yet when it comes both in theory and in practice, it will be followed as often as not by another head. A coin has no memory of how it fell on previous throws.

An exceedingly long series of heads would be so improbable as to establish an imperfection in the coin. This would persuade an observant person to bet not on tails but on another head. Similarly a number that has turned up often at Monte Carlo is perhaps a better bet than one that has not. There is no future compensation for the latter, while repetition

TAKING CHANCES—Large amounts are lost and won in gambling houses such as the one shown in the motion picture, "Lady Luck."

of a number suggests a possible bias in the wheel.

Other, more complicated betting systems than doubling up are based on the principle of increasing one's bet less than 100 per cent after a loss and diminishing it after a win. In this way more money is usually staked on winning bets. There is even a curious system in which two partners make opposite bets in roulette, the net effect being the difference of their bets on each play.

Systems Do Not Work

But none of these systems works. Every system carries a small chance of a great loss, and the smaller the chance, the greater loss. It will fail just often enough and cost just enough to cancel all its gains.

No mere combination or arrangement of bets can disturb the balance of favorable and unfavorable chances for each bet. No mathematical jugglery can cancel one iota of the total risk. You can only rearrange the hazards, concentrate or distribute them, but not change their sum.

Some gamblers feel it should be mathematically possible to distribute bets in a horse race so as to win, or at least break even, no matter which horse wins. Market odds make this impossible.

Consider a race between two horses, All Ahead and Blue Bell, the first of which would win twice as often as the second. Knowledge of their relative performances would result in twice as much money being bet on the first as on the second.

Correct Odds

The correct odds would be 2 to 1 on Blue Bell and .50 to 1.00 on All Ahead. If the track percentage were 15 per cent, the odds would become 1.55 to 1.00 on Blue Bell and only .55 to 2.00 on All Ahead.

When the odds are correct, you would break even if you bet $2 on All Ahead all of the time, winning two-thirds of the time, or if you bet $1 on Blue Bell, winning one-third of the time. But by such betting at the above track odds, you would lose 15 per cent of the total amount bet.

If you have $3 to bet on a race, you will break even regardless of the result if, when the odds are correct, you bet $2 on All Ahead and $1 on Blue Bell. But at the above track odds, this system, which represents the best possible hedging, will always result in the loss of 15 per cent of the total amount you bet.

TURF BETTING—Odds 20% lower than correct mathematical odds are usually offered by the race track.

Every gambler feels that though his system may fail for any given number of bets, it is bound to succeed eventually if he only plays it long enough. But to survive a long chain of possible losses requires an almost inexhaustible fortune.

A person with $99 gambling fairly against with $1 will win the $1 a total of 99 times out of 100, but the hundredth time he will lose his whole $99. The small chance of a great loss inevitably recurs and restores the perfect symmetry between favorable and unfavorable chances.

In professional gambling, the greater fortune generally belongs to the bank. The inveterate gambler who is never content with moderate gains or losses is in effect pitting his limited wealth against the relatively limitless resources of the gambling bank, or even of society at large. Here his near-certainty of losing is counterbalanced by the fabulous fortune which he has one chance in millions of winning.

On rare exceptions the odds might even favor the bettor. The odds on a fight, for instance, might be 6 to 5 at one place and 5 to 6 at another because of the way the fans of the two fighters are placing their bets. Then by betting $5 against $6 at each place, you are bound to win $1.

Bettors who maintain such inconsistent odds are putting you in the position of the gambling bank. Collectively they are giving money away, and there is no mathematical argument against taking such money if you are ever lucky enough to find it. But these odds could not be maintained long in an open market without bankruptcy. In general, market odds fall substantially short of the correct odds.

Similarly, if the odds on the same event are first 6 to 5, and then 5 to 6, by betting $5 against $6 at each time, you are bound to win $1. But you are still flirting with chance. In making the first bet, you were making in addition a concealed bet that the odds would change in your favor, a bet which you might have lost.

In any gambling, the odds are slightly against the bettor because the money he may gain by an even bet has a slightly smaller value to him than that which he may lose. This difference in value is negligible for small variations in his fortune, but may become ruinous for large sums.

Science News Letter, March 8, 1947

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Do You Know?

In cold countries such as Alaska, crop *plants* seldom put their roots down into the soil more than eight inches, although plants of the same kinds penetrate far deeper in warmer climates.

Pocket mice, kangaroo mice, kangaroo rats and dipodomys are among small animals found in the sand dunes of *Nevada;* they live principally on the seeds of desert grasses and other vegetation.

Malta island, in the Mediterranean, has mysterious monuments and ruins of stone-age temples that show it was inhabited many hundreds of years before Christ; it has also fossil remains of now extinct animals.

England is producing a phenol-formaldehyde *coating* for wood and metal products that is claimed to be resistant to heat, moisture and chemical action, and offers protection against termites and marine borers.

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BACTERIOLOGY

Nazi Try at Germ Warfare

Underground movements to make biological warfare weapons could do considerable damage. Attempts would have been unsuccessful because of U. S. vaccines.

➤ DEVELOPMENT of germ warfare weapons by an underground movement in former enemy territory, such as is reported claimed by Nazi diehards just rounded up by American and British occupation forces, is perfectly possible.

A few fanatic scientists, working secretly in an attic or cellar laboratory, could produce enough deadly germs to do considerable damage, if they could find ways of dispersing them on unprotected populations. Producing weapons of germ warfare does not require the amount of space, money, manpower and materials needed to produce atom bombs.

Nazis at Work

Nazi scientists were working on biological warfare during the war. This was disclosed at the Nuremberg trials of Nazi physicians as war criminals.

The Nazi bacteriologists believed that the only way the Nazis could conquer the United States would have been by a three-pronged germ attack against man, domestic animals and food plants. They realized that they were considerably behind the Americans in development of germ warfare, and wanted to speak to Hitler and get his support for further work on this line.

The underground attempt to develop germ warfare weapons probably was an effort to continue the work begun during the war. Unless a great deal of progress had been made since the war, it probably would not have succeeded. Documents at the Nuremberg trials showed that the Nazi bacteriologists had only one experiment which they considered so successful they need not repeat it. In other words, they apparently thought they had one weapon ready for use if Hitler had been willing to use it.

This weapon may have been rinderpest. In that case, it was doomed to fail because American and Canadian scientists had developed a successful vaccine for protection against this devastating cattle plague.

Plague and anthrax are two diseases mentioned in reports of the underground movement just discovered. There is reason to believe we had defenses against these germ weapons also.

Underground attempts to develop germ warfare weapons might well prove suicidal to the underground workers themselves. Elaborate precautions to protect workers from the deadly germs they worked with were taken in our own biological warfare station at Camp Detrick, Md. In spite of this, some cases of disease developed. It would be even harder to take adequate protective measures in an underground, perhaps poverty-stricken laboratory.

The suicidal results might have extended to the German civilian population if a weapon such as plague had been loosed against the occupation forces. While rats and lice for spreading bubonic plague may be controlled in occupied Germany, pneumonic plague spreads directly from man to man and is highly contagious as well as highly fatal. Underfed German civilians would be as ready prey to its onslaught as the occupation troops.

BW Failure

Successful attack on growing crops could probably not be made by underground BW plotters. Growth-promoting hormones, which are the munitions of this kind of warfare, require rather elaborate chemical setup to produce. Once produced, they have to be sprayed over wide areas to have material effect. The only practicable means for this is aircraft, and in considerable numbers at that.

Even during the war, though the Nazis had excellent chemical manufacturing plants and could have produced the hormones in any necessary quantity, they could not have attacked American crops because they lacked far-ranging aircraft to distribute the sprays. We had the chemicals, we had the planes, and if the war had continued into 1946 we could and would have attacked both German and Japanese crops with this new weapon.

Science News Letter, March 8, 1947

It is estimated that about one person in every 10,000 is an *albino.*

ZOOLOGY

NATURE RAMBLINGS
by Frank Thone

Usefulness of Bats

➤ IF BATS FLEW in the daytime instead of at night, if they sang sweetly instead of merely squeaking, if they looked less like winged mice—in short, if bats were birds, doubtless people would like them better. Yet even in their unloved, hobgoblin form, bats are highly useful animals, rivalling, or rather supplementing, birds in their role as insect-catchers.

At a recent meeting of the National Speleological Society, Charles E. Mohr of the Academy of Natural Sciences of Philadelphia called attention to the economic importance of bats. Many people already know that bats destroy enormous quantities of insects, especially moths, insects and beetles. However, one important angle may have been overlooked: since bats fly at night, when most insect-eating birds are asleep, they take toll of nocturnal insects that would otherwise escape.

All species of bats in this country are insectivorous, and may therefore be rated as "good" animals from the human point of view. We do not have the shudder-causing vampire bats or the orchard-raiding fruit bats of the tropics in our cooler regions, so the aura of wickedness that has somehow attached itself to bats really doesn't fit, so far as the United States is concerned.

Bats' insect-destroying activities, like birds', have sometimes been overrated. It is unlikely that any insect species has been destroyed, or is even kept down to minimal numbers, by either bats or birds. Our living insect-traps, whether their wings be leathern or feathered, are useful but are not the final answers to insect pest problems. For this reason, the much-publicized bat roosts that were erected a couple of decades ago, were foredoomed to failure in their mission as mosquito-control devices.

Bats have a positive economic importance as well as the negative one of insect destruction. As fish-eating birds leave heavy deposits of guano, valuable as fertilizer, on their island rookeries, so bats build up accumulations of guano on the floors of their cavern roosting-places. Mr. Mohr stated that something like $500,000 worth of guano has been taken out of Carlsbad Caverns alone. And during the War of 1812 and the Civil War, bat-guano deposits in Southern caves were important sources of saltpeter, necessary ingredient of black powder.

Science News Letter, March 8, 1947

GENERAL SCIENCE

Scientific Talent Doesn't Follow Parents' Occupation

➤ SCIENTIFIC promise in young people has no discernible relation to what their parents do, it is disclosed by a study of the parentage of the 40 winners in the Sixth Annual Science Talent Search who gathered in Washington for the five-day Science Talent Institute.

Businessmen and lawyers are among the fathers of the young men and women who represent the cream of this year's scientific crop among high school graduates, but others list paternal occupations as laborer, electrician, carpenter, tailor. Numerically the occupations are listed as: eight businessmen, six teachers, three engineers, three lawyers, two investment brokers. The following occcupations are represented by one father each: clergyman, publisher, compositor, tailor, carpenter, biologist, laborer, electrician, plant quarantine inspector, well driller, motion picture writer.

All mothers listed are homemakers, but some are able to carry on full-time jobs as well. Four of the mothers are teachers, and one each is occupied as dietitian, advertising director, editor, bookkeeper, factory worker.

Six of the winners have only one parent living. Ten of the 40 are only children; 20 have at least one brother or sister. Only one comes from a family with as many as four children. About 17% have parents who attended college.

Science News Letter, March 8, 1947

Nose-prints of dogs correspond to finger-prints of men; veterinarians say that every dog's nose is different, and that their nose-prints are reliable for identifying valuable animals.

OPTICS

Infra-Red Rays Used To Examine Eyes

➤ EXAMINING HUMAN eyes with invisible infra-red rays appears to be a new use for this type of radiation.

The instrument and method used was described to the American Optical Society meeting in New York by Dr. M. J. Koomen and Dr. R. Tousey, with the U. S. Naval Research Laboratory, and Dr. H. A. Knoll, now at the Ohio State University but formerly with the Naval Laboratory.

The advantage of using this invisible infra-red "light" is that it does not disturb the eye under observation as do rays from ordinary light. The reflected rays form an image which is made visible to the observer by use of a telescope similar to those used on Army sniperscopes.

The sniperscope, attached to a rifle, shot out infra-red beams which were reflected back by an enemy prowling in the dark, clearly outlining him in the receiving telescope. In examining the eye, the ray is used to measure the pupil, and the instrument is called an infra-red pupillometer.

With this device, the eye pupil appears dark and the iris bright. A lighted scale within it becomes superimposed upon both pupil and iris in such a way that it is possible to measure the pupil with considerable accuracy. The accuracy is limited largely to involuntary fluctuations and movements of the eye.

Science News Letter, March 8, 1947

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ANTHROPOLOGY

Earliest American Found

Near Mexico City the remains of an unfortunate hunter were found by a geophysical prospecting method. Skull is estimated at 10,000 to 15,000 years old.

➤ REMAINS of America's earliest known human being, with age estimated at ten to fifteen thousand years, have been discovered near Mexico City through the use of a geophysical prospecting method borrowed from seekers after oil and ores. This triumph of the very new to find the very old was achieved by a tri-national scientific team consisting of Dr. Hans Lundberg, Canadian geophysicist, Dr. Helmut de Terra, American geologist, and several Mexican scientists, operating under the auspices of the American Viking Fund, of New York.

Dr. de Terra describes the skull as very primitive, with long, narrow shape as seen from the top, a low-vaulted cranium, and pronounced eyebrow ridges. Although he does not undertake to classify it on such short notice, these features do suggest such Old-World primitives as Neandertal and Peking men. Its estimated age in years, however, is considerably less than theirs. With the complete skull were some of the other skeletal bones.

This earliest American apparently came to his end in the rush and excitement of an elephant hunt. His skull and bones were found buried under about three and one-half feet of soil along with a great quantity of mammoth bones, tusks and teeth. The locality, near the town of Texpexpan, was obviously the marshy shore of a shallow lake in early post-glacial time. Apparently this luckless hunter's more fortunate mates drove the elephant herd into the marsh, where the great beasts bogged down and perished.

Earlier digs in the same vicinity had turned up numbers of stone weapon-heads of a primitive pattern, and similar artifacts have been found with bones of elephants and other extinct animals in the southwestern United States; but this is the first time that any part of a human being has ever been dug up at such an ancient site. It is the find that archaeologists have been awaiting for decades.

The method used in locating the present sensational find is what prospectors call earth conductivity. It consists in sending an electric current into the ground, measuring the potential of the soil at many surrounding points, and plotting lines of equal potential. At the spot where the measurements showed the highest resistance, the scientists made their first trial dig.

They struck a bonanza.

Science News Letter, March 8, 1947

ORDNANCE

V-2 Rockets Deteriorate

➤ U. S. ARMY ORDNANCE is not having as much success firing German V-2 rockets as the Nazis who developed the weapon.

The Army at the White Sands, N. Mex., Proving Ground has fired 19 of the missiles, armed with scientists' instruments to gather data in the upper atmosphere. Of the 19 launched, five have failed to climb high over the desert in useful flights.

This gives the Army rocket-firing unit a "batting average" of slightly less than 75% for its V-2 shoots, compared with a better than 80% success claimed by German experimenters at the Peenemunde Experiment Station on the Baltic, where the weapon was tested before its use against England in World War II.

When the rockets were fired at England, an estimated 30% of them failed, but the Army program, which fires one rocket about every two weeks, is more comparable to the test flights at the Baltic station.

Army Ordnance officials believe the bad shoots are caused by deterioration. The rockets used in the New Mexico experiments were taken in May, 1945, and virtually all of the intricate mechanisms are retained intact for the peacetime scientific firing.

German scientists, who fired new rockets, believed the weapons would deteriorate quickly if not used.

Although credited by some Army sources with being the twentieth rocket fired, the one shot over the desert recently, from which scientific instruments were successfully parachuted to the earth from a high altitude, was actually number 19. First rocket of the series was given a static test on the ground without actually being launched.

In addition to the standard scientific instruments brought down by the parachute from a record altitude, fruit flies, a package of seeds and cameras loaded with color film were carried by the 'chute.

Scientists hope to learn more about the effects of cosmic rays at high altitudes from the fruit flies and seeds, while unique pictures and possible new knowledge of the upper atmosphere are expected from the camera record of the descent.

Science News Letter, March 8, 1947

MIGRATION

Mexican Border Fence To Improve Patrolling

➤ THE 2,000-MILE line fence proposed for the Mexican boundary, as an aid in keeping foot-and-mouth disease out of the United States, is not expected to function all by itself. Its advocates expect the fence, if built, to make the job of the border patrol easier and more effective—but it will still have to be backed by vigilant human eyes and ears.

The proposed fence (of which short sections have already been built) is to be of the interwoven, heavy spring-wire type often seen around factories. Its ten-foot height is necessary in order to keep deer and antelope, which are potential carriers of foot-and-mouth disease, from jumping over the top. It will also have to be securely anchored in the ground, to prevent peccaries, or wild pigs, from rooting their way under.

The proposed fence is not to be thought of as a barrier against foot-and-mouth disease alone. If properly patrolled, it should do much to control smuggling, and particularly the entry of unauthorized immigrants, or "wetbacks", who at present slip across the border in large numbers during the truck-growing and fruit-picking seasons. This illicit migration is as little liked by the Mexican government as by our own, and anything that can be done to check it will be welcomed by the Mexican authorities.

Science News Letter, March 8, 1947

Soil rich in *nitrogen* is not suitable for newly rooted plant cuttings.

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AROUND THE GARDEN—Dorothy H. Jenkins—*Barrows,* 206 p., illus., $2.50. A discussion for month-by-month use of what to do in the garden for eye-catching results.

DOMESTIC HEATING IN AMERICA—Report of a Joint Party from the Ministry of Fuel and Power and the Dept. of Scientific and Industrial Research—*British Information Service,* 152 p., paper, $1. A study of heating, cooking, and hot water supply in small houses in the U.S.A. and Canada.

ESCUELA AGRICOLA PANAMERICANA YEARBOOK—*Middle America Information Bureau,* 38 p., illus., paper, free. Dedicated to the first graduating class from this school which is spreading improved agricultural methods in the American tropics.

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INDIANS BEFORE COLUMBUS—Paul S. Martin, George I. Quimby, and Donald Collier—*Univ. of Chicago Press,* 582 p., illus., $6. A history of the development of basic cultural trends among the pre-Columbian Indians of North America is traced through 20,000 years.

PHYSICAL CHEMISTRY — Herschel Hunt — *Crowell,* 610 p., illus., $4.75. A college text on the fundamentals of physical chemistry emphasizing the mathematical formulation of ideas with selected and graded problems covering each topic.

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THE PROBLEM OF ODORS IN INSTITUTIONS —Dewey H. Palmer—*Hospital Bur. of —Stds. and Supplies,* 11 p., paper, 50 cents. This tells the types and sources of odors in institutions and how to get rid of them.

PUERTO RICAN PARADOX—Vincenzo Petrullo —*Univ. of Pa. Press,* 180 p., $3. An interpretation of the relationship today between Puerto Rico and the United States with suggestions for improvement.

REPORT OF THE FAO PREPARATORY COMMISSION ON WORLD FOOD PROPOSALS, Washington, D. C., USA, 28 Oct. 1947—24 Jan. 1947—*Food and Agriculture Organization of U.N.,* 84 p., paper, free. A statement of international proposals and agreements to raise nutritional standards.

RHEUMATIC FEVER, Childhood's Greatest Enemy—Herbert Yahres — *Public Affairs Committee,* Pamphlet No. 126, 30 p., 10 cents. A comprehensive discussion of a pressing health problem.

SEMIMICRO LABORATORY EXERCISES FOR HIGH SCHOOL CHEMISTRY—Fred T. Weisbruch—*Heath,* 268 p., illus., paper, $1.48. A well planned manual resulting from practical classroom experience in adapting this cleaner and less expensive procedure for high schools.

THE SOCIAL SYSTEM OF THE MODERN FACTORY; The Strike: A Social Analysis—W. Lloyd Warner and J. O. Low—*Yale Univ. Press,* Yankee City Series, Vol. 4, 240 p., $3. The industrial history of "Yankee City" traced, showing the changed status of managers and workers, why the strike occurred, and how it progressed.

THE THEORY OF FUNCTIONS OF REAL VARIABLES—Lawrence M. Graves—*McGraw-Hill,* 298 p., $4. An exposition of the more fundamental and generally useful parts of this mathematical field, together with some theorems on implicit functions, differential equations, and Lebesgue and Stieltjes integrals.

THOMAS ALVA EDISON; Builder of Civilization—H. Gordon Garbedian — *Julian Messner,* 231 p., illus., $2.50. This absorbing story of the "man of a thousand patents" should challenge teen-agers.

UNITED STATES NATIONAL COMMISSION FOR THE UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION. Report on the First Meeting, September 1946—Dept. of State Publ. 2726, U.S.—U.N. Info. Series 14, *Govt. Printing Office,* 41 p., paper, 25 cents. The organization of America's end of UNESCO.

Science News Letter, March 8, 1947

PLANT PHYSIOLOGY

Fungus Injections Make Gum Ooze from Pines

➤ BETTER YIELDS of turpentine and rosin can be obtained by deliberately inoculating the pine trees with spores of a disease fungus at the time they are tapped, Dr. George H. Hepting, U. S. Department of Agriculture plant pathologist, has discovered in experiments at the Southeastern Forest Experiment Station in Asheville, N. C., according to *Science* (Feb. 21).

He had noticed that pine branches infected with a species of Fusarium, one of the worst of plant-disease fungi, oozed quantities of resinous gum for a long time. It occurred to him to try induced infections on the slashes made on the tree trunks when the gum was wanted for production of naval stores.

He made mass cultures of the fungus and prepared a filtrate containing its spores. With the help of a colleague, E. R. Roth, he brushed this onto slashes cut through the bark of a number of trees, and into holes bored into the trunks of others. As a control, some of the same filtrate that had been boiled to kill the spores was applied to other trees.

The trees treated with the live spores yielded far larger quantities of gum, and continued the flow much longer, than did the uninfected control trees. Now Dr. Hepting is undertaking further experiments, to determine whether there are any long-time ill effects on the trees that would offset the immediate advantages of using induced infection to get more gum with less work.

Science News Letter, March 8, 1947

ZOOLOGY

Laughing Grave Robbers Come to Philadelphia Zoo

➤ THE PHILADELPHIA ZOO'S latest additions include a quartet of grave robbers, who arrived with peals of weird laughter.

Zoo officials hasten to explain that their new grave robbers, four hyenas, are actually useful scavengers who do some of nature's "dirty work" cleaning up the remains of dead and decaying animals. But the hyenas do get into graveyards once in a while.

Two of the newcomers are laughing hyenas, spotted animals from Africa with a weird, demoniacal laugh. The other two hyenas are striped animals found both in Africa and southern Asia.

Arriving with the hyenas were two antelopes, the large and beautiful greater kudu and the rare blesbok. Rounding out the strange animal party were a pair of servals, small leopard-like animals from Africa.

Science News Letter, March 8, 1947

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❁ *FLY WALLETS that float are for fishermen who change flies in midstream. They prevent a dropped collection of trout-bait from sinking. These English-style fly and leader wallets are made of water-resistant cork, and a transparent plastic through which the contents are visible.*

Science News Letter, March 8, 1947

❁ *QUARTER-ROUND trim for baseboards in homes and offices is made of steel and is designed to hold electric wiring. It is installed without the use of nails or screws by means of spaced prongs on its under rear which are pushed under the baseboard.*

Science News Letter, March 8, 1947

❁ *MICROPROJECTOR, an inexpensive type for school use, throws on a screen a clear picture of a specimen mounted on an ordinary microscope slide. It also can be used as a microscope by looking through the front lens. A simple attachment converts it into a film strip projector.*

Science News Letter, March 8, 1947

❁ *WASHBOARD, designed for women living in small apartments, is made entirely of aluminum. It is approximately 10 by 15 inches in size and weighs nine ounces. Rubber-tipped and rubber-stripped, it will neither slip nor mar porcelain washstands.*

Science News Letter, March 8, 1947

❁ *ELECTRIC TOOL for woodworkers and others has 36 interchangeable accessories such as abrasive wheels, drills, buffing wheels and brushes. Housed in a shockproof plastic case with an aluminum frame, the motor shaft extends to a metallic tool-gripping nose as shown in the picture.*

Science News Letter, March 8, 1947

❁ *NEGATIVE hanger, for photographers who do their own developing, is adjustable for the films ordinarily used. It is made of all-welded nickel-finished stainless steel, with a horizontal and a vertical movable cross-piece which are held where wanted by thumb screws.*

Science News Letter, March 8, 1947

❁ *FIBER-GLASS automobile tires, of high-strength glass cord fabric, have been constructed and tested but are not yet ready for the market. Lighter than other tires, their particular advantages over other cord materials are high strength and resistance to heat.*

Science News Letter, March 8, 1947

❁ *WATER-SHEDDER, a chemical compound which forms an invisible coating over glass, plastics, paper and textiles, prevents moisture from gathering on their surfaces. It can be used to prevent vacuum tubes from going dead under conditions of high humidity, and has many other applications.*

Science News Letter, March 8, 1947

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